



Plug-In Hybrid
Electric Vehicles
(PHEVs)

Plug-in Partners National Campaign

Building a Market for Gas-Optional Flexible-Fuel Hybrids

Plug-In Hybrid Electric Vehicles: The near-term solution

- Plug-in hybrid electric vehicles (PHEVs) can dramatically decrease American dependence on imported oil, reduce greenhouse gases and other air pollutants, as well as lower fuel costs for American consumers.
- PHEVs use the same technology as the popular hybrids on the road today, but have a more powerful battery that can be recharged in a standard home outlet.
- PHEVs are outfitted with a battery pack sufficient to power the vehicle from 20 to 60 miles on battery charge alone.
- Since half the cars on America's roads are driven 25 miles a day or less, a plug-in with a 25-mile range battery could eliminate gasoline use in the daily commute of millions of Americans.
- PHEV technology is already available and functioning. Daimler-Chrysler has developed and is testing a prototype PHEV commercial van with a 20-mile all-electric range. Conversions of existing hybrids ranging from sedans to SUVs are on the road today and show that the technology works.
- PHEVs can be manufactured with flexible fuel engines, magnifying the economic, environmental and security benefits while also benefiting American agriculture.
- An "electric" equivalent gallon of gas will cost 70-80 cents at prevailing electric rates versus the \$2.00+ national average gasoline price.
- The electric infrastructure is in place and available. Over 40% of the generating capacity in the U.S. sits idle or operates at a reduced load overnight, when most PHEVs would be recharged. Our power system could charge tens of millions of PHEVs without requiring new plants.



Plug-in Partners Plan

- **Establish community grass-roots campaign to demonstrate that a market exists for PHEVs.**
- **Campaign components include rebates, "soft" fleet orders, petitions and endorsements.**
- **Campaign partners are local and state governments, utilities and environmental, consumer and business organizations.**

Visit us online at www.pluginpartners.org

Plug-In Hybrid Electric Cars

Enjoy Broad Support



“If by 2025, all cars on the road are hybrids and half are plug-in hybrids, U.S. oil imports would drop by 8 million barrels per day (mbd). Today, the United States imports 10 mbd and is projected to import almost 20 mbd by 2025.”

— *Set America Free initiative, a coalition of prominent individuals and non-profit organizations concerned about the security and economic implications of America’s growing dependence on foreign oil*

“Plug-in Hybrid Vehicles allow us to use made-in-the-USA energy for most of our driving, breaking the yoke of our dependence on oil.”

— *Institute for Analysis of Global Security*

“In fact, thanks to the existing grid’s excess capacity at night, it should be possible to support up to 30 percent of the nation’s vehicles equipped with plug-in batteries of 20-mile range and not have to expand electricity generation.”

— *Frank Gaffney, President, Center for National Security Policy*

“When you consider that 78 percent of Americans live within 20 miles of their jobs, and that most car trips — commuting, shopping and dropping off the kids at soccer games — are less than 20 miles, plug-in hybrids could run solely on electricity for these types of short trips and commutes.”

— *Consumer Reports*

“Our studies show a strong market preference for plug-in hybrid vehicles when performance is equal and the cost difference is reasonable.”

— *Bob Graham, Area Manager, Transportation, EPRI*

“We think the transportation fuel sector should be diversified by utilizing more electricity as a fuel (for) plug-in hybrids that can get 100 miles per gallon and allow you to run on electricity alone for 20 to 30 miles, then shift to the combustion engine.”

— *Gal Luft, Director of the Institute for the Analysis of Global Security, an energy-security think tank in Washington*

“We believe that the 50 largest cities in this country, united in purpose, can build a groundswell of demand sufficient to entice carmakers to mass produce what is the logical near term response towards the critical goal of energy independence. We intend to set the example in Austin, Texas.”

— *Will Wynn, Mayor of Austin, Texas*



Building a Market for a Flexible-Fuel PHEV

Plug-In Partners is a national grass-roots campaign to demonstrate that a market exists right now for flexible-fuel Plug-In Hybrid Electric Vehicles (PHEVs).

Key components of the campaign include rebates and incentives, “soft” fleet orders, petitions and endorsements. Partners in this campaign are local and state governments, utilities, and environmental, consumer and business organizations.

“Plug-In Austin” kicked off August 22, 2005. Cities and organizations across America are invited to use this identifying logo, and launch a Plug-In (name of City) campaign for their locale.



Rebates and Incentives

Rebates and incentives could be provided through various sources, including electric utilities — a logical source, since the industry stands to receive additional revenues if PHEVs achieve significant market penetration.

Austin Energy has set aside \$1 million for rebates for local governments, businesses and citizens to buy down the additional cost of PHEVs above the cost of a regular hybrid. Rebates or incentives could also be provided by businesses or organizations to their employees, perhaps as a match to a utility rebate or tax incentive.

Fleet Orders

Advanced commitments for PHEVs for future fleet needs are an important component of the campaign. These “soft” fleet commitments will demonstrate to automakers that governments and business fleet buyers are seriously interested in purchasing PHEVs. Committing to the future purchase of a fixed number of PHEV vehicles, when they become available, would be ideal.

Petitions

The collection of signatures will allow a large number of Americans to speak directly to automakers. The petition being utilized in Austin simply states that the signer understands what plug-ins are, and that they will seriously consider buying such a vehicle if it is manufactured. [Petitions can be signed online at www.pluginpartners.org](http://www.pluginpartners.org)

Endorsements

Endorsements demonstrate organizational support for plug-ins in the form of a City Council or County Court resolution, a legislative resolution, or a statement of support from a local or national environmental, consumer or civic group or other organization. When an organization endorses the Plug-In Partners campaign, it is voicing its support for the mass production of PHEVs and will promote plug-ins to its membership.

National Database

The City of Austin will maintain a national database at www.pluginpartners.org to which rebate and incentive offers, soft fleet orders, the number of signatures collected by each locale and endorsements can be reported. Summary data will be maintained, and a summary report will be issued to all campaigns, the media and automakers on a quarterly basis.

Available Tools

To assist in the development of Plug-In (name of City) campaigns, the following can be downloaded at www.pluginpartners.org:

- Sample City Council and County Court resolutions
- Sample “soft” fleet order form
- Petition for the collection of signatures
- Letters of invitation seeking participation by environmental and business groups
- Plug-In logo and this Plug-In Partners brochure
- Links to a variety of resources.

Frequently asked Questions about Plug-In Hybrid Electric Vehicles (PHEV)

Are PHEVs available today?

DaimlerChrysler has developed and is testing a plug-in Sprinter Van prototype with an all-electric range of 20 miles. There are also many conventional hybrids, from sedans to SUVs, that have been converted to plug-ins. Some are getting up to 60 all-electric miles per charge.

Does the plug-in technology work?

Yes. This has been clearly demonstrated by several sedan and SUV conversions at the Hybrid Center at the University of California at Davis. Recent modifications of Toyota's popular Prius have attracted considerable attention to what have been called 100+ MPG hybrids, and, when the gasoline is replaced by bio-fuels, 500 MPG hybrids. A California non-profit, California Cars, modified a Prius by adding a 2.4 kWh lead-acid pack to prove that it could be done. Then, an R&D company, EnergyCS, replaced the standard 1.3 kWh battery pack with a 9 kWh battery pack. The lithium-ion batteries came from Valence Technology, an Austin-based company. The larger battery pack was sufficient to provide half of the power needed to drive the first 60 miles each day. The cost of the charge was about 72 cents. It's like having a second small fuel tank, only you fill this one with electricity at an equivalent cost of under \$1 per gallon, depending on your car and your electric rate. You refill at home, from an ordinary 120-volt socket, with energy that's much cleaner and cheaper and not imported.

What is the problem then?

The cost of the batteries needed to power a PHEV a sufficient distance is considered to be the stumbling block. Generally, every 10 miles of charge capacity of a battery will add about \$1,000 in cost. That additional cost, however, is offset by lower operating costs since an "electric" gallon of gas will cost about one-third the cost of gasoline, allowing a PHEV to achieve four times the gas

mileage of a conventional vehicle. Even at current prices, EPRI has shown that the total lifetime cost to buy, operate and maintain a PHEV is lower than that of a gasoline car or a conventional hybrid.

What distance must a commercially produced PHEV be able to achieve on the battery alone?

A battery pack capable of powering a PHEV 40 miles could meet the daily driving needs of the majority of drivers without requiring the use of the gasoline mode of the PHEV at all. Some 78% of Americans live within 20 miles of their jobs. In many cases, drivers of PHEVs would only need to fill up with gasoline a few times a year, versus the current 24-36 times a year on average.

Won't power plants create a great deal of additional pollution powering PHEVs?

Pollution is easier to manage at a central point such as the stacks of power plants rather than from millions of vehicle tail pipes. Many power plants today are being modified to lower emissions, and a number of older plants are being retired. Wind-generated power, solar and other forms of renewable energy are pollution free and are becoming more available. The overnight charging of PHEVs matches well with wind-generated electricity (the most abundant green power), the majority of which is produced overnight due to wind patterns.

What about performance? Will PHEVs be slow?

No. A Toyota Prius, modified with a larger plug-in battery, will have essentially the same accelerating power and speed capability of a hybrid.

How much more will a PHEV cost versus a comparably sized conventional vehicle?

It is projected that in mass production, a PHEV could be produced at a cost very close to that of a comparably sized and outfitted conventional vehicle. EPRI studies project that after considering the lower costs of fuel and maintenance, a mass-produced PHEV should provide better overall economics than either a HEV or a conventional vehicle.

Contact Information:

www.pluginpartners.org



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